

New Hampshire Volunteer Lake Assessment Program

2002 Bi-Annual Report for Great Pond Kingston



NHDES
Water Division
Watershed Management Bureau
6 Hazen Drive
Concord, NH 03301



OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **GREAT POND**, the program coordinators recommend the following actions.

FIGURE INTERPRETATION

- **Figure 1 and Table 1:** The graphs in Figure 1 (Appendix A) show the historical and current year chlorophyll-a concentration in the water column. Table 1 (Appendix B) lists the maximum, minimum, and mean concentration for each sampling season that the lake/pond has been monitored through the program.

Chlorophyll-a, a pigment naturally found in plants, is an indicator of the algal abundance. Because algae are usually microscopic plants that contain chlorophyll-a, and are naturally found in lake ecosystems, the chlorophyll-a concentration found in the water gives an estimation of the concentration of algae or lake productivity. The mean (average) summer chlorophyll-a concentration for New Hampshire's lakes and ponds is 7.02 ug/L.

Similar to the summer of 2001, the summer of 2002 was filled with many warm and sunny days and there was a lower than normal amount of rainfall during the latter-half of the summer. The combination of these factors resulted in relatively warm surface waters throughout the state. The lack of fresh water to the lakes/ponds reduced the rate of flushing which may have resulted in water stagnation. Due to these conditions, many lakes and ponds experienced increased algae growth, including filamentous green algae (the billowy clouds of green algae typically seen floating near shore), and some lakes/ponds experienced nuisance cyanobacteria (blue-green algae) blooms.

NORTH STATION

The current year data (the top graph) show that the chlorophyll-a concentration **increased steadily** from June to September. The chlorophyll-a concentration on each sampling event was **less than** the state mean.

The historical data (the bottom graph) show that the 2002 chlorophyll-a mean is **less than** the state mean.

Overall, visual inspection of the historical data trend line (the bottom graph) shows **a relatively stable** in-lake chlorophyll-a trend since monitoring began in 1995. Specifically, the mean annual chlorophyll concentration has ranged between approximately **3 and 5 mg/L** since monitoring began.

After 10 consecutive years of sample collection, we will be able to conduct a statistical analysis of the historic data to objectively determine if there has been a significant change in the annual mean chlorophyll-a concentration since monitoring began.

SOUTH STATION

The current year data (the top graph) show that the chlorophyll-a concentration **decreased gradually** from June to August, and then **increased** from August to September. The chlorophyll-a concentration on each sampling event was **less than** the state mean.

The historical data (the bottom graph) show that the 2002 chlorophyll-a mean is **less than** the state mean.

Overall, the statistical analysis of the historical data show that the chlorophyll-a concentration has **significantly increased** since monitoring began. Specifically, the chlorophyll-a concentration has **increased** (meaning **worsened**) on average by approximately **3.3 percent** per sampling season during the sampling period **1991 to 2002**. (Note: Please refer to Appendix E for the statistical analysis explanation and data print out.)

While algae are naturally present in all lakes/ponds, an excessive or increasing amount of any type is not welcomed. In freshwater lakes/ponds, phosphorus is the nutrient that algae depend upon for growth. Therefore, algal concentrations may increase when there is an increase in nonpoint sources of nutrient loading from the watershed, or in-lake sources of phosphorus loading (such as phosphorus releases from the sediments). It is important to continually educate residents about how activities within the watershed can affect phosphorus loading and lake quality.

- **Figure 2 and Table 3:** The graphs in Figure 2 (Appendix A) show historical and current year data for lake/pond transparency. Table 3 lists the maximum, minimum and mean transparency data for each sampling season that the lake/pond has been monitored through the program.

Volunteer monitors use the Secchi-disk, a 20 cm disk with alternating black and white quadrants, to measure water clarity (how far a person can see into the water). Transparency, a measure of water clarity, can be affected by the amount of algae and sediment from erosion, as well as the natural colors of the water. The mean (average) summer transparency for New Hampshire's lakes and ponds is 3.7 meters.

Two different weather related patterns occurred this past spring and summer that influenced lake quality during the summer season.

In late May and early June of 2002, numerous rainstorms occurred. Stormwater runoff associated with these rainstorms may have increased phosphorus loading, and the amount of soil particles washed into waterbodies throughout the state. Some lakes and ponds experienced lower than typical transparency readings during late May and early June.

However, similar to the 2001 sampling season, the lower than average amount of rainfall and the warmer temperatures during the latter-half of the summer resulted in a few lakes/ponds reporting their best-ever Secchi-disk readings in July and August (a time when we often observe reduced clarity due to increased algal growth)!

NORTH STATION

The current year data (the top graph) show that the in-lake transparency **decreased slightly** from June to July, **increased slightly** from July to August, and then **decreased very slightly** from August to September.

The historical data (the bottom graph) show that the 2002 mean transparency is **less than** the state mean.

Overall, visual inspection of the historical data trend line (the bottom graph) shows **a relatively stable** trend for in-lake transparency since monitoring began. Specifically, the transparency has ranged between approximately **3** and **4** meters since monitoring began in 1995.

Again, after 10 consecutive years of sample collection, we will be able to conduct a statistical analysis of the historic data to objectively determine if there has been a significant change in the annual mean transparency since monitoring began.

SOUTH STATION

The current year data (the top graph) show that the in-lake transparency **increased very gradually** from June to August, and then **decreased** from August to September.

The historical data (the bottom graph) show that the 2002 mean transparency is **less than** the state mean.

Overall, the statistical analysis of the historical data (the bottom graph) show that the mean annual in-lake transparency has **not significantly changed** (either *increased* or *decreased*) since monitoring began in **1991**. Specifically, the in-lake transparency has **varied** (meaning **fluctuated**), but has not *continually increased* or *decreased* since monitoring began. (Note: Please refer to Appendix E for the statistical analysis explanation and data print out.)

Typically, high intensity rainfall causes erosion of sediments into lakes/ponds and streams, thus decreasing clarity. Efforts should continually be made to stabilize stream banks, lake/pond shorelines, disturbed soils within the watershed, and especially dirt roads located immediately adjacent to the edge of tributaries and the lake/pond. Guides to Best Management Practices designed to reduce, and possibly even eliminate, nonpoint source pollutants, such as sediment loading, are available from NHDES upon request.

- **Figure 3 and Table 8:** The graphs in Figure 3 (Appendix A) show the amounts of phosphorus in the epilimnion (the upper layer) and the hypolimnion (the lower layer); the inset graphs show current year data. Table 8 (Appendix B) lists the annual maximum, minimum, and median concentration for each deep spot layer and each tributary since the lake/pond has joined the program.

Phosphorus is the limiting nutrient for plant and algae growth in New Hampshire's freshwater lakes and ponds. Too much phosphorus in a lake/pond can lead to increases in plant and algal growth over time. The median summer total phosphorus concentration in the epilimnion (upper layer) of New Hampshire's lakes and ponds is 11 ug/L. The median summer phosphorus concentration in the hypolimnion (lower layer) is 14 ug/L.

NORTH STATION

The current year data for the epilimnion (the top inset graph) show that the total phosphorus concentration **decreased** from June to July, **increased** from July to August, and then **decreased slightly** from August to September.

The historical data show that the 2002 mean epilimnetic total phosphorus concentration is **slightly less than** the state median.

The current year data for the hypolimnion (the bottom inset graph) show that the total phosphorus concentration **increased steadily** from June to August, and then **decreased** from August to September.

The historical data show that the 2002 mean hypolimnetic total phosphorus concentration is ***much greater than*** the state median.

Overall, visual inspection of the historical data trend line for the epilimnion show ***a relatively stable*** total phosphorus trend, which means that the concentration has ***remained approximately the same*** in the epilimnion since monitoring began in 1995.

Overall, visual inspection of the historical data trend line for the hypolimnion shows ***a variable*** total phosphorus trend. This means that the mean annual concentration has ***fluctuated***, but has not *continually increased* or *decreased* since monitoring began in 1995.

SOUTH STATION

The current year data for the epilimnion (the top inset graph) and the hypolimnion (the bottom inset graph) show that the total phosphorus concentration ***decreased*** from June to July, ***increased*** from July to August, and then ***decreased*** from August to September.

The historical data show that the 2002 mean epilimnetic total phosphorus concentration is ***approximately equal to*** the state median.

The historical data show that the 2002 mean hypolimnetic total phosphorus concentration is ***greater than*** the state median.

Overall, the statistical analysis of the historical data show that the total phosphorus concentration in the epilimnion (upper layer) and the hypolimnion (lower layer) has ***not significantly changed*** (either *increased* or *decreased*) since monitoring began in **1991**. Specifically, the total phosphorus concentration in the epilimnion has remained ***relatively stable*** and has been ***approximately equal to*** the state median. The total phosphorus concentration in the hypolimnion has ***varied*** (meaning ***fluctuated***), but has not *continually increased* or *decreased* since monitoring began. (Note: Please refer to Appendix E for the statistical analysis explanation and data print out.)

One of the most important approaches to reducing phosphorus loading to a waterbody is to continually educate watershed residents about its sources and how excessive amounts can adversely impact the ecology and value of lakes and ponds. Phosphorus sources within a lake or pond's watershed typically include septic systems, animal waste, lawn fertilizer, road and construction erosion, and natural wetlands. If you would like to educate watershed residents about how they can help to reduce phosphorus loading into the lake/pond, please contact the VLAP Coordinator.

TABLE INTERPRETATION**➤ Table 2: Phytoplankton**

Table 2 lists the current and historic phytoplankton species observed in the lake/pond.

The dominant phytoplankton species observed this year at the **NORTH STATION** were *Anabaena* (a cyanobacterium), *Ceratium* (a dinoflagellate), and *Dinobryon* (a golden-brown algae).

The dominant phytoplankton species observed this year at the **SOUTH STATION** were *Synura* (a golden-brown algae), *Ceratium* (a dinoflagellate), and *Dinobryon* (a golden-brown algae).

Phytoplankton populations undergo a natural succession during the growing season (Please refer to page 12 of the “Biological Monitoring Parameters” section of this report for a more detailed explanation regarding seasonal plankton succession). Diatoms and golden-brown algae are typical in New Hampshire’s less productive lakes and ponds. An overabundance of cyanobacteria (previously referred to as blue-green algae) indicates that there may be an excessive total phosphorus concentration in the lake/pond, or that the ecology is out of balance.

➤ Table 2: Cyanobacteria (Blue-green algae)

In addition to *Anabaena*, a cyanobacterium, being the dominant species in the **NORTH STATION** plankton sample this season, small amounts of the cyanobacterium *Microcystis* was also observed.

In the **SOUTH STATION** plankton sample, small amounts of *Microcystis* and *Anabaena* were observed.

If present in large amounts, *Anabaena* and *Microcystis* can be toxic to livestock, wildlife, pets, and humans. Cyanobacteria can reach nuisance levels when excessive nutrients and favorable environmental conditions occur.

As with the summer of 2001, we observed that some lakes and ponds had cyanobacteria present during the 2002 summer season, likely due to the many warm and sunny days that occurred this summer, which may have accelerated algal and bacterial growth. In addition, the lower than normal amount of rainfall during the latter half of the summer, meant that the slow flushing rates resulted in less phosphorus exiting the lake outlet and more phosphorus being available for plankton growth.

The presence of cyanobacteria serves as a reminder of the lake's/pond's delicate balance. Watershed residents should continue to act proactively to reduce nutrient loading into the lake/pond by eliminating fertilizer use on lawns, keeping the lake/pond shoreline natural, re-vegetating cleared areas within the watershed, and properly maintaining septic systems and roads.

In addition, residents should also observe the lake/pond in September and October during the time of fall turnover (lake mixing) to document any algal blooms that may occur. Cyanobacteria (blue-green algae) have the ability to regulate their depth in the water column by producing or releasing gas from vesicles. However, occasionally lake mixing can affect their buoyancy and cause them to rise to the surface and bloom. Wind and currents tend to "pile" cyanobacteria into scums that accumulate in one section of the lake/pond. If a fall bloom occurs, please contact the VLAP Coordinator.

➤ **Table 4: pH**

Table 4 (Appendix B) presents the in-lake and tributary current year and historical pH data.

pH is measured on a logarithmic scale of 0 (acidic) to 14 (basic). pH is important to the survival and reproduction of fish and other aquatic life. A pH below 5.5 severely limits the growth and reproduction of fish. A pH between 6.5 and 7.0 is ideal for fish. The mean pH value for the epilimnion (upper layer) in New Hampshire's lakes and ponds is 6.5, which indicates that the surface waters in state are slightly acidic. For a more detailed explanation regarding pH, please refer to page 16 of the "Chemical Monitoring Parameters" section of this report.

The mean pH at the **NORTH STATION** deep spot this season ranged from **6.39** in the hypolimnion to **6.80** in the epilimnion.

The mean pH at the **SOUTH STATION** deep spot this season ranged from **6.40** in the hypolimnion to **6.75** in the epilimnion,

These data indicate that the lake is ***slightly acidic***.

Due to the presence of granite bedrock in the state and the deposition of acid rain, there is not much that can be done to effectively increase lake/pond pH.

➤ **Table 5: Acid Neutralizing Capacity**

Table 5 in Appendix B presents the current year and historic epilimnetic ANC for each year the lake/pond has been monitored through VLAP.

Buffering capacity or ANC describes the ability of a solution to resist changes in pH by neutralizing the acidic input to the lake. For a more detailed explanation, please refer to page 16 of the “Chemical Monitoring Parameters” section of this report.

The Acid Neutralizing Capacity (ANC) of the epilimnion (the upper layer) at the **NORTH STATION** and at the **SOUTH STATION** was **greater than** the state mean of 6.7 mg/L as CaCO_3 (Table 5).

However, it is important to point out the mean annual ANC for both deep spots was **much greater than** has been measured in previous sampling seasons. In particular, the ANC for both deep spots on the August sampling event was approximately 22 to 23 mg/L as CaCO_3 , which is approximately **2.5 times greater than** the highest values measured previous to this season. The VLAP Coordinator checked the calculations and verified that the calculations were done correctly. It is possible that an error occurred in the laboratory when the test was run. We will observe the ANC results closely next season to see if these high values occur again.

➤ **Table 6: Conductivity**

Table 6 in Appendix B presents the current and historic conductivity values for tributaries and in-lake data. Conductivity is the numerical expression of the ability of water to carry an electric current. For a more detailed explanation, please refer to page 16 of the “Chemical Monitoring Parameters” section of this report.

The conductivity has **increased** in the lake/pond and most of the inlets (not including Ball Rd Inlet) since monitoring began (Table 6). Typically, sources of increased conductivity are due to human activity. These activities include septic systems that fail and leak leachate into the groundwater (and eventually into the tributaries and the lake/pond), agricultural runoff, and road runoff (which contains road salt during the spring snow melt). New development in the watershed can alter runoff patterns and expose new soil and bedrock areas, which could contribute to increasing conductivity. In addition, natural sources, such as iron deposits in bedrock, can influence conductivity. It is possible that the lower than normal amount rainfall during the latter-half of the summer reduced tributary and lake flushing, which allowed pollutants and ions to build up and resulted in elevated conductivity levels.

We recommend that your monitoring group conduct stream surveys and stormwater sampling along the inlets with elevated conductivity so that we can determine what may be causing the increases. In addition, we recommend that your monitoring group conduct bracket sampling in areas where best management practices were previously installed to determine the effectiveness of the systems. For a detailed explanation on how to conduct a stream survey, stormwater sampling, or bracket sampling, please refer to this year's "Special Topic Article" which is included in Appendix D of this report.

Overall, the mean annual conductivity in **Ball Rd Inlet** has **decreased** in the lake/pond since monitoring began. This **decreasing** trend in conductivity is a **positive** sign of the reduction of pollutants in this portion of the watershed. We hope this trend continues!

➤ **Table 8: Total Phosphorus**

Table 8 in Appendix B presents the current year and historic total phosphorus data for in-lake and tributary stations. Phosphorus is the nutrient that limits the algae's ability to grow and reproduce. Please refer to page 17 of the "Chemical Monitoring Parameters" section of this report for a more detailed explanation.

The total phosphorus concentrations in the **Ball Rd Inlet**, **Great Pond Park Road Inlet**, and **Thayer Road Inlet**, continued to be **elevated** this season. These stations have had a history of **elevated** and **fluctuating** total phosphorus concentrations. We recommend that your monitoring group conduct stream surveys and stormwater sampling along these inlets so that we can determine what may be causing the increases.

➤ **Table 9 and Table 10: Dissolved Oxygen and Temperature Data**

Table 9 in Appendix B shows the dissolved oxygen/temperature profile(s) for the 2002 sampling season. Table 10 shows the historical and current year dissolved oxygen concentration in the hypolimnion (lower layer). The presence of dissolved oxygen is vital to fish and amphibians in the water column and also to bottom-dwelling organisms. Please refer to the "Chemical Monitoring Parameters" section of this report for a more detailed explanation.

At the **NORTH STATION**, the dissolved oxygen concentration was **greater than 100%** saturation at **0.1** meters and **1.0** meter at the deep spot on the **July** sampling event. Layers of algae can raise the dissolved oxygen in the water column, since oxygen is a by-product of photosynthesis. Wave action from wind can also dissolve atmospheric oxygen into the upper layers of the water column.

At the **NORTH** and **SOUTH STATION**, the dissolved oxygen concentration was **low in the hypolimnion**. As stratified lakes/ponds age, oxygen becomes **depleted** in the hypolimnion (the lower layer) by the process of decomposition. Specifically, the loss of oxygen in the hypolimnion results primarily from the process of biological breakdown of organic matter (i.e.; biological organisms use oxygen to break down organic matter), both in the water column and particularly at the bottom of the lake/pond where the water meets the sediment.

In addition, during this season (and many past sampling seasons) the lake/pond has had a *lower* dissolved oxygen concentration and a *higher* total phosphorus concentration in the hypolimnion (the lower layer) than in the epilimnion (the upper layer). These data suggest that the process of **internal total phosphorus loading** (commonly referred to as **internal loading**) is occurring in the lake/pond. When oxygen levels are depleted to less than 1 mg/L in the hypolimnion (as it was this season and in many past seasons), the phosphorus that is normally bound up with metals in the sediment may be re-released into the water column. Depleted oxygen concentration in the hypolimnion of thermally stratified lakes/ponds typically occurs as the summer progresses.

The **low** oxygen level in the hypolimnion is a sign of the lake's/pond's **aging** and **declining** health. This year the DES biologist conducted the temperature/dissolved oxygen profile in **July**. We recommend that the annual biologist visit for the 2003 sampling season be scheduled during **August** so that we can determine how severe the oxygen is depleted in the hypolimnion **later** in the sampling season.

➤ **Table 11: Turbidity**

Table 11 in Appendix B lists the current year and historic data for in-lake and tributary turbidity. Turbidity in the water is caused by suspended matter, such as clay, silt, and algae. Water clarity is strongly influenced by turbidity. Please refer to page 19 of the "Other Monitoring Parameters" section of this report for a more detailed explanation.

The turbidity of the **SOUTH STATION** hypolimnion (lower layer) sample was elevated on the **July** sampling event. This suggests that the lake/pond bottom may have been disturbed by the anchor or by the Kemmerer Bottle while sampling. When the lake/pond bottom is disturbed, sediment, which typically contains attached phosphorus, is released into the water column. When collecting the hypolimnion sample, please check to make sure that there is no sediment in the Kemmerer Bottle before filling the sample bottles.

DATA QUALITY ASSURANCE AND CONTROL

Annual Assessment Audit:

During the annual visit to your lake/pond, the biologist conducted a “Sampling Procedures Assessment Audit” for your monitoring group. Specifically, the biologist observed the performance of your monitoring group while sampling and filled out an assessment audit sheet to document the ability of the volunteer monitors to follow the proper field sampling procedures (as outlined in the VLAP Monitor’s Field Manual). This assessment is used to identify any aspects of sample collection in which volunteer monitors are not following the proper procedures, and also provides an opportunity for the biologist to retrain the volunteer monitors as necessary. This will ultimately ensure that the samples that the volunteer monitors collect are truly representative of actual lake and tributary conditions.

Overall, your monitoring group did an **excellent** job collecting samples on the annual biologist visit this season! Specifically, the members of your monitoring group followed the proper field sampling procedures and there was no need for the biologist to provide additional training. Keep up the good work!

Sample Receipt Checklist:

Each time your monitoring group dropped off samples at the laboratory this summer, the laboratory staff completed a sample receipt checklist to assess and document if the volunteer monitors followed proper sampling techniques when collecting the samples. The purpose of the sample receipt checklist is to minimize, and hopefully eliminate, future re-occurrences of improper sampling techniques.

Overall, the sample receipt checklist showed that your monitoring group did a **very good** job when collecting samples this season! Specifically, the members of your monitoring group followed the majority of the proper field sampling procedures when collecting and submitting samples to the laboratory. However, the laboratory did identify a few aspects of sample collection that the volunteer monitors could improve upon. They are as follows:

- **Sample Labels:** On the **June** sampling event, there were two sets of sample bottles that were labeled with the station name Ball Rd Inlet, and there was no bottles labeled with the station name Kelly Brook. However, by process of elimination or by contacting the volunteer monitors, it was possible for the lab to determine which sample bottles corresponded to what sampling locations. Please make sure

to label your samples with a waterproof pen (a black sharpie permanent marker works best), preferably before sampling.

- **Complete Sample Sets:** On the **August** sampling event, a phosphorus was not submitted for the South Station metalimnion. Please make sure to fill up a phosphorus bottle and a big white sample bottle (pH, turbidity, conductivity) at each sample location.

NOTES

Monitor's Note (6/16/02): Much rain in the month of June.

Laboratory Note (6/16/02): The turbidity of the South Station epilimnion was not run due to a laboratory error. We apologize for this loss of data.

Monitor's Note (8/29/02): All tributaries dry. Kelly Brook has a man made rock dam which inhibits flow

Laboratory Note (8/29/02): A total phosphorus sample was not submitted for the south station metalimnion.

Monitor's Note (9/15/02): No rain. All tributaries dry.

USEFUL RESOURCES

Changes to the Comprehensive Shoreland Protection Act: 2001 Legislative Session, NHDES Fact Sheet, (603) 271-3505, or www.des.state.nh.us/factsheets/sp/sp-8.htm

Cyanobacteria in New Hampshire Waters Potential Dangers of Blue-Green Algae Blooms, NHDES Fact Sheet, (603) 271-3505, or www.des.state.nh.us/factsheets/wmb/wmb-10.htm

The Lake Pocket Book. Prepared by The Terrene Institute, 2000. (internet: www.terrene.org, phone 800-726-4853)

Managing Lakes and Reservoirs, Third Edition, 2001. Prepared by the North American Lake Management Society (NALMS) and the Terrene Institute in cooperation with the U.S. Environmental Protection Agency. Copies are available from NALMS (internet: www.nalms.org, phone 608-233-2836), and the Terrene Institute (internet: www.terrene.org, phone 800-726-4853)

Organizing Lake Users: A Practical Guide. Written by Gretchen Flock, Judith Taggart, and Harvey Olem. Copies are available from the Terrene Institute (internet: www.terrene.org, phone 800-726-4853)

Proper Lawn Care in the Protected Shoreland: The Comprehensive Shoreland Protection Act, WD-SP-2, NHDES Fact Sheet, (603) 271-3503 or www.des.state.nh.us/factsheets/sp/sp-2.htm

Sand Dumping - Beach Construction, WD-BB-15, NHDES Fact Sheet, (603) 271-3503 or www.des.state.nh.us/factsheets/bb/bb-15.htm

Swimmers Itch, WD-BB-2, NHDES Fact Sheet, (603) 271-3503 or www.des.state.nh.us/factsheets/bb/bb-2.htm

Use of Lakes or Streams for Domestic Water Supply, WD-WSEB-1-11, NHDES Fact Sheet, (603) 271-3503 or www.des.state.nh.us/factsheets/ws/ws-1-11.htm

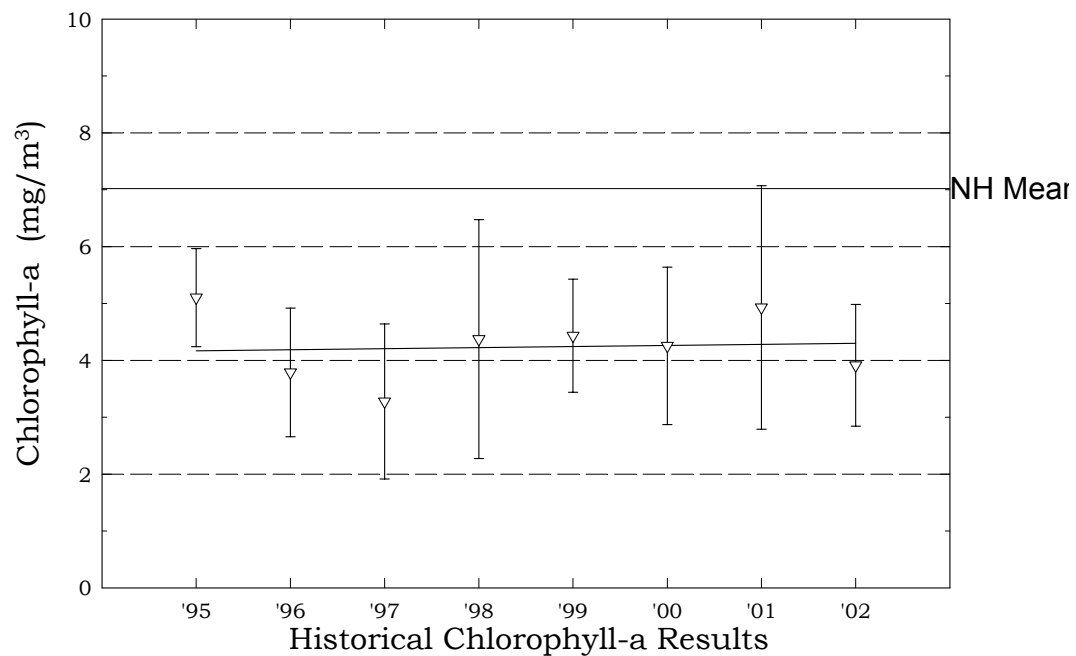
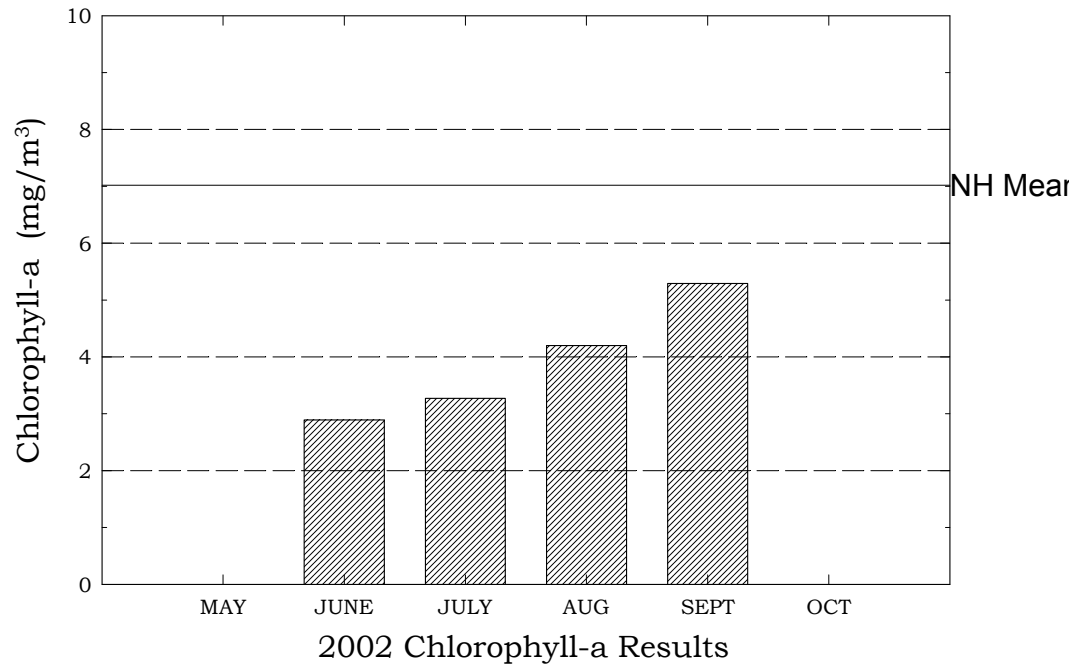
Water Milfoil, WD-BB-1, NHDES Fact Sheet, (603) 271-3503 or www.des.state.nh.us/factsheets/bb/bb-1.htm

Weed Watchers: An Association to Halt the Spread of Exotic Aquatic Plants, WD-BB-4, NHDES Fact Sheet, (603) 271-3503 or www.des.state.nh.us/factsheets/bb/bb-4.htm

Appendix A: Graphs

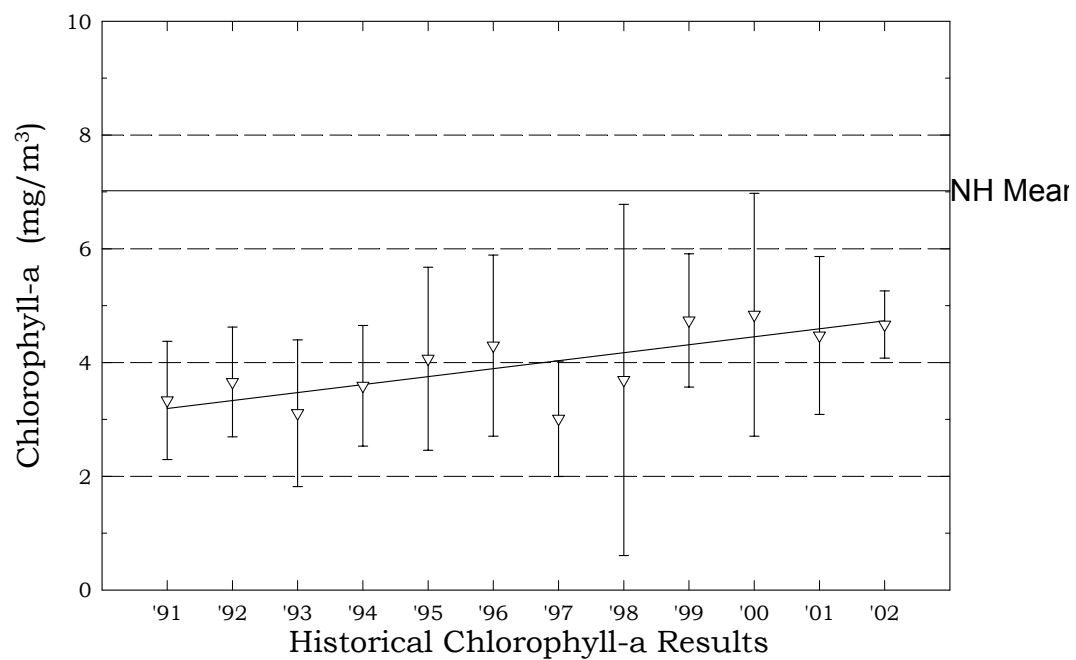
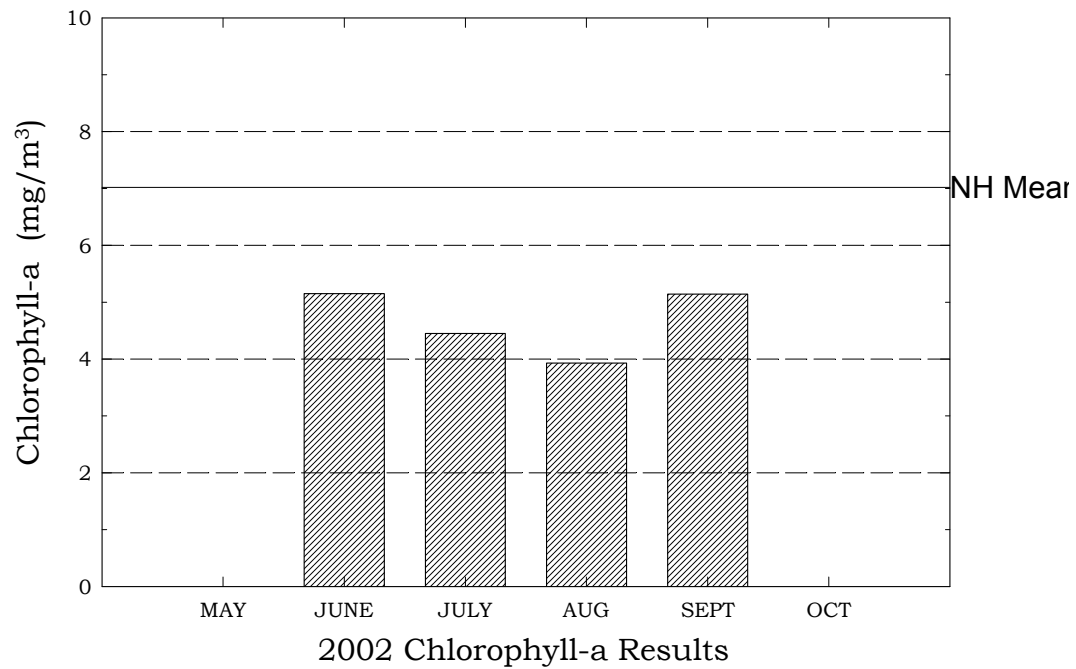
Great Pond, North, Kingston

Figure 1. Monthly and Historical Chlorophyll-a Results



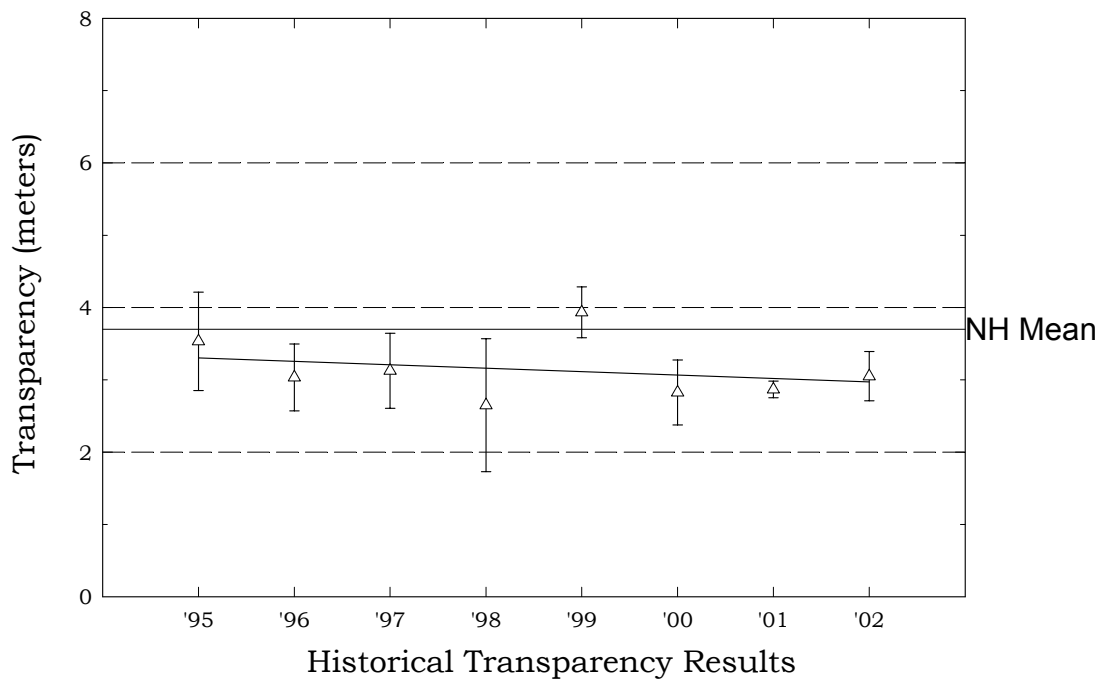
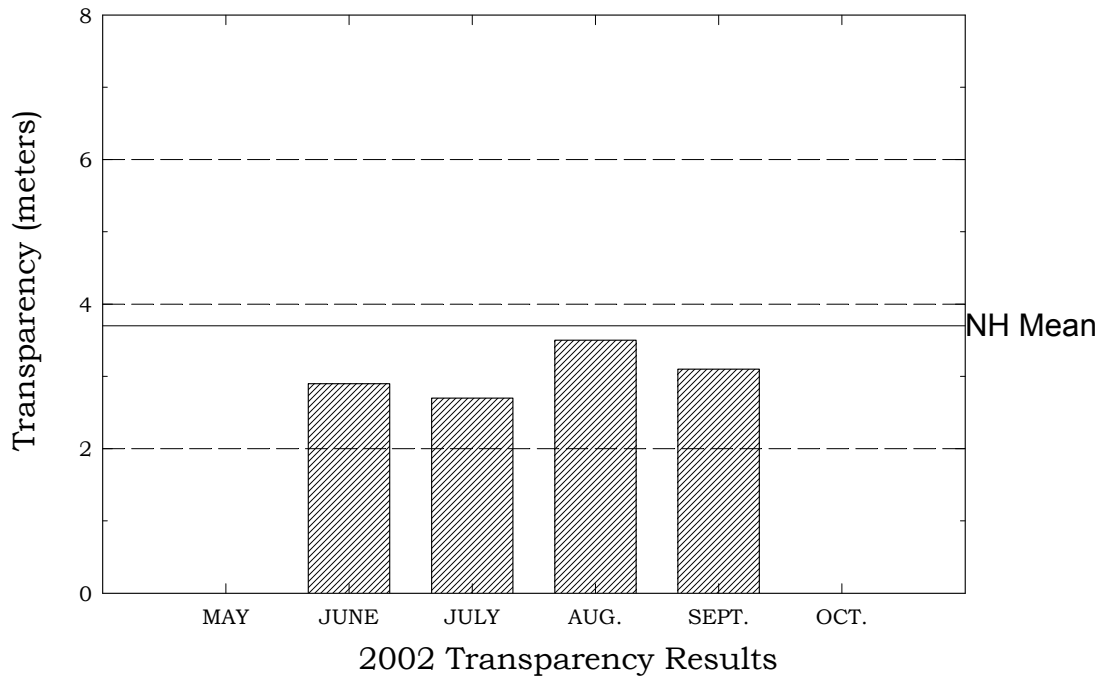
Great Pond, South, Kingston

Figure 1. Monthly and Historical Chlorophyll-a Results



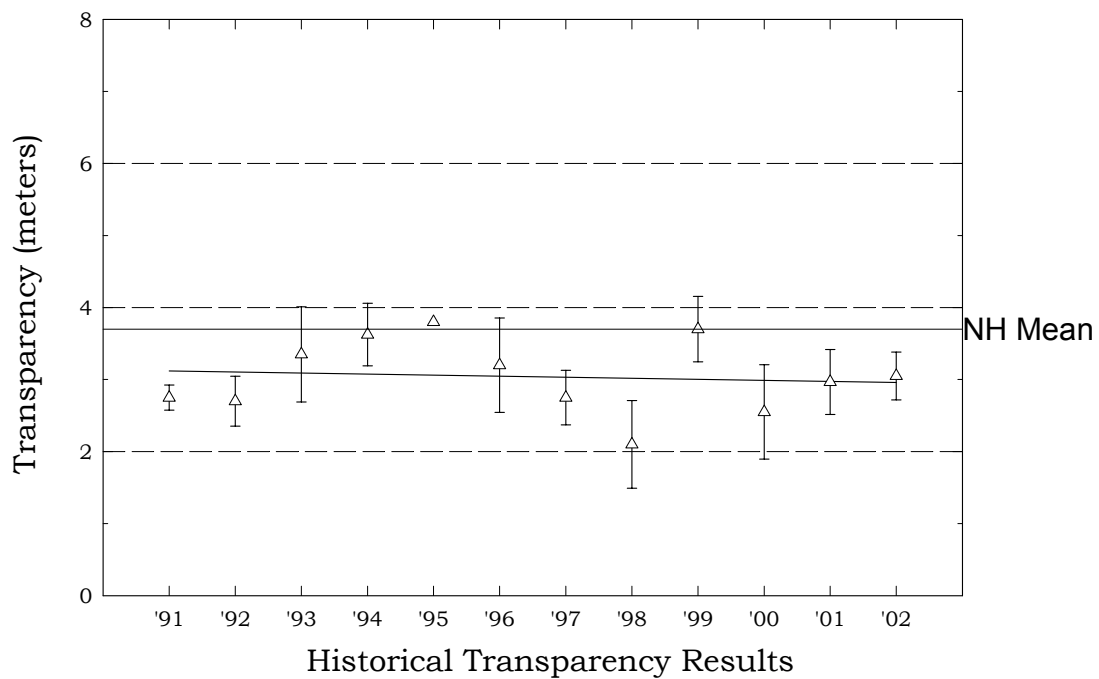
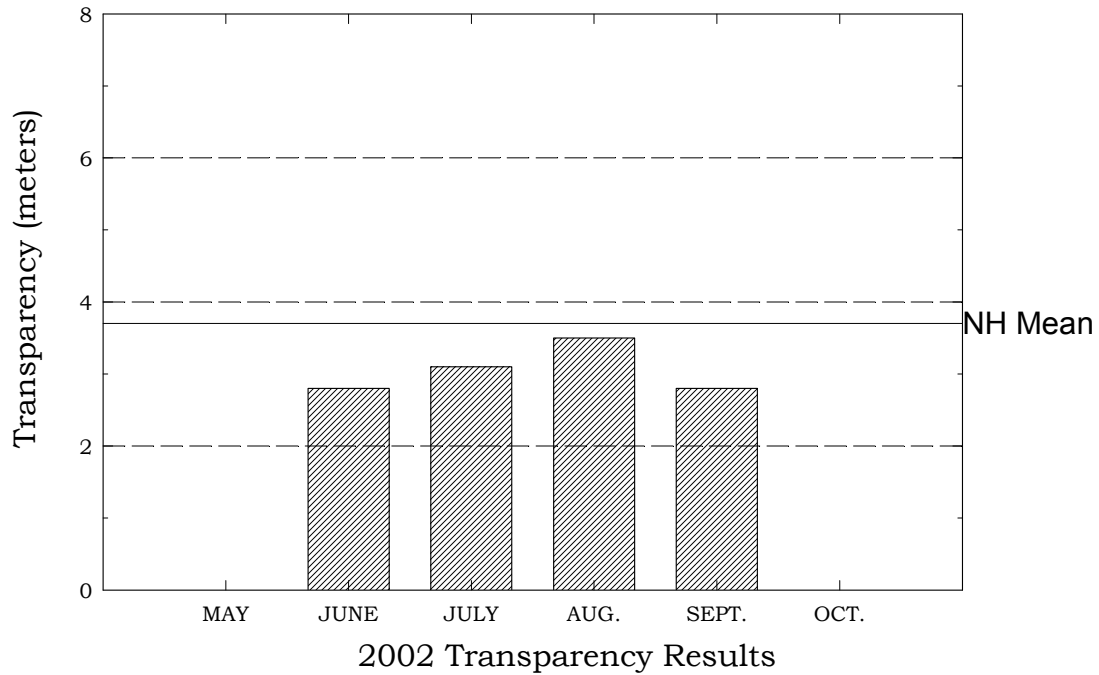
Great Pond, North, Kingston

Figure 2. Monthly and Historical Transparency Results



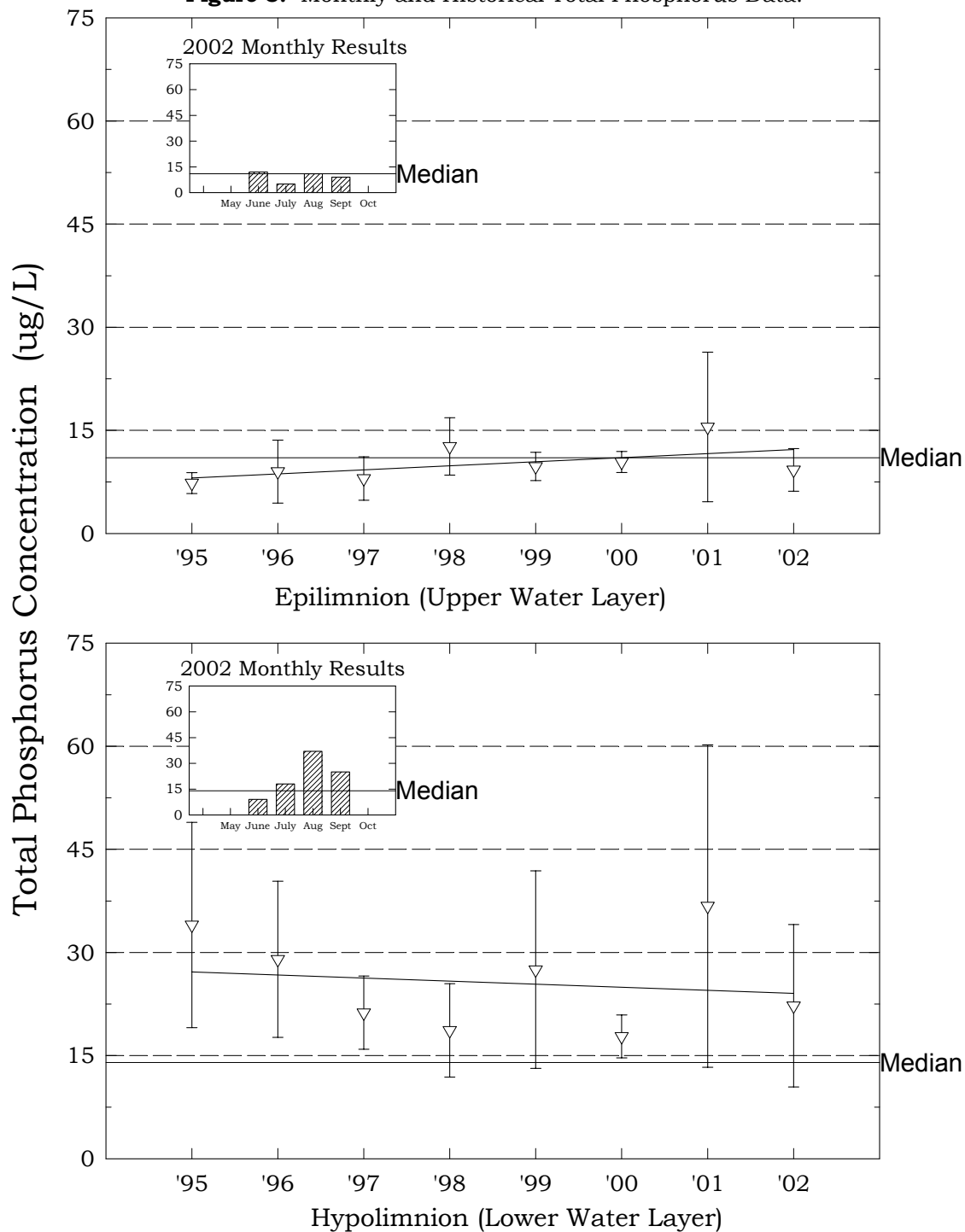
Great Pond, South, Kingston

Figure 2. Monthly and Historical Transparency Results



Great Pond, North, Kingston

Figure 3. Monthly and Historical Total Phosphorus Data.



Great Pond, South, Kingston

Figure 3. Monthly and Historical Total Phosphorus Data.

